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To: Vance Lipausky
Coast Oyster Company

From: G. Scott Jeane II

Subject: Analysis of Water Quality and Unknown
Fibers from Willapa Bay

In response to your request for assistance in locating possible conditions in Nahcotta Harbor the following is submitted.

Fiber Sample

On September 17 a sample of unknown fibers was collected from the green sand filter on the hatchery influent water. This sample was submitted to the Western Washington State Crime Laboratory for analysis. Their report summarized the sample to consist of animal, vegetable and synthetic fibers of varied colors; miscellaneous biological matter; resin-embedded fiberglass, various particles of plastic and particles suggesting oyster shell. Approximately 60% of the sample consisted of fibers and hairs. Plastic particles and resin-embedded fiberglass amounted to 15-25%. Less than 6% of the sample was wood pulp. A listing of fibers is presented below:

Cotton:

white mercerized
black mercerized
red mercerized
turquoise blue mercerized
gray mercerized
blue and white mercerized
turquoise blue treated
gray treated
white treated (many)

Wool:

light yellow (course)
white (fine, virgin)
white (coarse)
light blue
turquoise blue

Acrylic:

dark blue
medium blue
brown
dark blue

Acetate

gray delustered (one fiber only)

Nylon

white

Nylon or Polyester

gray
green
light blue

Polyester

white bright
light (fine)
white delustered

Hair

human
cat
squirrel
raccoon

Wood Fragments

mostly Douglas fir
other (unidentified)

"Plastics"

fiberglass (in resin)
birefringent amorphous particles
birefringent matrix particles
molded particles (chips)

Analysis of Water Quality and Unknown Fibers from Willapa Bay

The presence of molded plastic chips was considered to be unusual. The chips had a molded cross striation pattern and were too large to possibly be from a pump impeller.

A private woolen mill laboratory examined a smaller sample submitted previously to Vern Mainz. The analysis revealed no natural clothing fibers (cotton, wool) and all synthetic fibers, with some hunks of woody fibers. Synthetic fibers identified were orlon, nylon, and Dacron. All colored fibers were synthetic. A large portion of the noncolored synthetic fibers appeared to be a type used to bind paper fibers together in disposable diapers. All fibers were observed to be shorter than natural and have frayed ends. This condition could be caused by domestic washing machines.

Water Quality

Several sampling trips (September 18 and November 18 of 1975) were completed in conjunction with other Willapa Basin studies. Nahcotta Harbor and East Main Drainage Ditch were sampled twice. Spot checks were completed at Espy and Pauls sloughs (see figures).

Sampling at the head and end of the Nahcotta dock for PBI (5 mg/L) and MBAS (Soap) (0.1 to <0.1) indicates no stratification within the harbor. The later harbor sample indicated low levels of nutrients ($\text{NO}_3\text{-N}$, 0.15 mg/l; $\text{NH}_3\text{-N}$, 0.04 mg/l; T-P-P, 0.09 mg/l), PBI (None Detected), and color (21 as pt-co units).

Flat boggy land topography, cranberry bogs and numerous sloughs are characteristic of the area. Pauls and Espy sloughs drain into Willapa Bay near Nahcotta and are similar in nutrients to Nahcotta Harbor, except for color (Pauls - 210, Espy - 680), PBI (None detected and 36 mg/l), and COD (35 mg/l and 71 mg/l). East Main Drainage is similar to Pauls and Espy sloughs except that the Longbeach Sewage Treatment Plant drains in the ditch via Tinker Lake. The ditch measured similar values of nutrients, COD, as the sloughs. The parameters color (630 units) and PBI (140 mg/l) were high. Copper and zinc values were below 0.02 mg/l. The East Main Ditch discharges to Willapa Bay 8 nautical miles south of Nahcotta.

Cranberry bogs are dispersed throughout the local area. Their use of pesticides during the latter part of their growing season is restricted by federal agencies. Any toxicity associated with pesticides from cranberry bogs would be higher early in the growing season.

The Nahcotta jetty tends to collect large amounts of unattached eelgrass which upon decay could release amounts of metals possibly toxic to juvenile oysters. A sample of windrowed eelgrass was collected and dried. The sample measured Ni-<100 mg, Cd - 1.04 mg, Ch- <40 mg, Cu - 120 mg, pb <40 mg and Zn 480 mg.

GSJ:ee

cc: Vern Mainz
Howard Steele
Gerry Calkins



